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10/823,923	04/14/2004	Keith Gray	PA2648US	5296

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EXAMINER

ARTMAN, THOMAS R

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/823,923

Applicant(s)

GRAY, KEITH

Examiner

Thomas R. Artman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-20 is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 1 is objected to because of the following informalities: antecedent basis is lacking for the “acquisition mode transition” in line 13. It appears that the term “data” should be added prior to the term “acquisition.” Antecedent basis is also lacking for “the data acquisition mode change” in lines 14-15. It appears that the term “change” should be “transition.” Appropriate correction is required.

Claim 2 is objected to because of the following informalities: antecedent basis is lacking for the “acquisition mode transition” of line 1. It appears as though the term “data” should be added prior to the term “acquisition.” Appropriate correction is required.

Claims 7-10, 12 and 14 are objected to because the limitations in lines 3-11 of claim 7, all of claim 9, lines 13-18 of claim 10, line 2 of claim 12 and all of claim 14 constitute functional descriptive material that is not structurally limiting without a computer and a computer readable medium: “When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium...since use of technology permits the function of the descriptive material to be realized.” MPEP § 2106 IV(B)(1). As such, the above limitations are not afforded patentable weight. Claim 8 is objected to by virtue of its dependency. Appropriate correction is required.

Claim 14 is further objected to for lacking antecedence for the term “acquisition mode change” in line 3. Perhaps the term “data” should be added before “acquisition.” Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the interrelationship between the flushing requirement of the array of integrating sensors and the remainder of the claimed structure.

Claim 8 is further rejected under this paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation of “the X-ray detector device” lacks proper antecedence since the limitation is not positively recited in the claims; instead, it appears as part of a functional limitation in line 2 of parent claim 7. Therefore, it is unclear whether or not the “X-ray detector device” is part of the invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Ganin (US 6,459,765 B1).

Regarding claim 1, Ganin discloses a detector device (Figs.1 and 2), including:

- a) a sensor array 26 configured to detect X-rays 17,
- b) an internal sync pulse source configured for flushing the sensor array (represented by “Detector Readout” line in Fig.2),
- c) an internal clock configured for triggering the internal sync pulse source to generate the internal sync pulse (col.6, lines 49-51),
- d) an external sync input 38 configured for triggering the internal sync pulse source to generate the internal sync pulse,
- e) a ready signal output (step 4 at time T2) configured to indicate when the internal sync pulse is generated responsive to the internal clock and when the internal sync pulse can be generated responsive to the external sync input, and
- f) an input 41 configured for initiating a data acquisition mode transition (Fig.2, step 5), where the internal sync pulse is generated using the internal clock during at least part of the data acquisition mode transition (see top line of Fig.2 between time T2 and step 11), and further

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where the internal sync pulse is generated using the external sync input 38 following the data acquisition mode transition.

With respect to claim 2, the data acquisition mode transition includes a change in data acquisition frame rate (timeframe C vs. time intervals of steps 11 and 12).

With respect to claim 3, the internal sync pulse is generated using the external sync input prior to the data acquisition mode transition (Fig.2, step 5).

Regarding claim 4, Ganin discloses a detector device (Figs.1 and 2), including:

- a) an internal clock (col.6, lines 49-51),
- b) a sensor array 26 configured to acquire data in a first data acquisition mode (represented by timeframes A, B and C) and to acquire data in a second data acquisition mode (represented by steps 11-14),
- c) an input 38 configured to for initiating a data acquisition mode change between the first data acquisition mode and the second data acquisition mode, and
- d) an electronic circuit 27, 36 for flushing the sensor array responsive to the internal clock during at least part of the data acquisition mode change and configured for flushing the sensor array responsive to an external signal 38 prior to the data acquisition mode change (see top line of Fig.2 and at least col.6, lines 47-57).

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With respect to claim 5, the data acquisition mode change is performed in less than four data acquisition frames (see top line of Fig.2, between timeframe C and step 11).

With respect to claim 6, the sensor array is configured to detect X-rays 17.

Regarding claim 7, Ganin discloses a control system (Figs.1, and 2), including: an interface 36 configured for communication with an X-ray detector device 27, where the interface is able to be configured to perform the function of communication including:

- a) an output signal (col.6, lines 49-51) configured to control frame start times of the X-ray detector device,

- b) an output signal (Fig.2, "Start Sequence") configured to initiate a data acquisition mode transition of the X-ray detector device, and

- c) an input signal (Fig.2, step 4) from the detector device, configured to indicate whether the frame start times are dependent or independent upon the output signal configured to control the frame start times.

Per the claim objection above, the only limiting structure in this claim is the requirement of an interface that communicates with the X-ray detector, and the functional limitations of the communication methodology are not structurally tied to the interface. Therefore, the claim is anticipated by Ganin.

With respect to claim 8, the X-ray detector device includes an array of integrating sensors requiring flushing.

With respect to claim 9, the interface is further able to be configured to perform the function of controlling the X-ray detector device in a master/slave relationship prior to the data acquisition mode transition and to re-establish the relationship following data acquisition mode transition (after step 15). Per the claim objection above, there are no structural limitations in this claim for showing distinction over the prior art of record. Therefore, the claim is anticipated by Ganin.

Regarding claim 10, Ganin discloses an X-ray system (Figs.1 and 2), including:

- a) a detector device having an array of sensors 26 configured to detect X-rays,
- b) an output (step 5) configured to indicate when an internal sync input can be used to trigger internal sync pulses for indicating frame starts, and
- c) an internal circuit 36 configured to flush the array of sensors responsive to an internal clock (col.6, lines 49-51) that triggers the internal sync pulses during at least a portion of a data acquisition mode change (top line, Fig.2), where
- d) a control system has data storage 30 configured to store X-ray data generated using the detector device, and further where
- e) the control system is able to be configured to perform the function of initiating the data acquisition mode change, have an output configured to provide the external sync input to the detector device, and further have an input configured to monitor the output of the detector device and detect the completion of the data acquisition mode change (col.6).

Per the claim objection above, the only limiting structure in this claim is the requirement of an interface that communicates with the X-ray detector, and the functional limitations of the

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communication methodology are not structurally tied to the interface. Therefore, the claim is anticipated by Ganin.

With respect to claim 11, the system further includes a data conduit configured for communicating signals from the detector device 27 to the control system 36 (Fig.2).

With respect to claim 12, the system further has an X-ray source 15 and the control system is further able to be configured to activate the X-ray source responsive to the frame starts (item 36, Fig.1).

With respect to claim 13, the system further includes an X-ray source 15 and mechanical control configured to move the X-ray source (inherent feature of all X-ray systems, at least for calibration and alignment).

With respect to claim 14, the system is further able to be configured to change a master-slave relationship between the detector device and the control system during the data acquisition mode change.

Allowable Subject Matter

Claims 15-20 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

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The prior art of record neither teaches nor reasonably suggests a method of operating an X-ray system, including:

a) sending a plurality of first frame start signals corresponding to a first acquisition mode are sent to a detector device,

b) sending a second signal to the detector device that initiates a change in acquisition mode from the first acquisition mode to a second acquisition mode,

c) receiving a third signal from the detector device that indicates that the change in acquisition mode is taking place while an internal clock is being used to flush a sensor array,

d) receiving a fourth signal from the detector device that indicates the ability to receive second frame start signals, and

e) sending a plurality of second frame start signals to the detector device which determine a frame starts in a second acquisition mode,

as required by the combination as claimed in claim 15.

Claim 16 is allowed by virtue of its dependency.

Although the prior art of record teaches the practice of a detector device receiving a prepare signal from a control system that facilitates a change in acquisition mode and flushing x-ray sensors in an array using an internal clock, the prior art of record neither teaches or reasonably suggests the method of operating a detector device, including:

a) receiving the prepare signal of a change in acquisition mode from the control system,

b) sending a first signal from the detector device to the control system indicating that internal sync pulses are being generated due to an internal clock,

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c) sending a second signal from the detector device to the control system indicating that the detector is ready for receiving frame start signals,

d) receiving the frame start signals, thus using the frame start signals instead of the internal clock for generating internal sync pulses, and

e) flushing the x-ray sensors using the internal sync pulse generated responsive to the frame start signals,

as required by the combination as claimed in claim 17.

Claims 18 and 19 are allowed by virtue of their dependency.

The prior art of record neither teaches nor reasonably suggests an X-ray system having means for notifying, means for generating, means for receiving and means for switching as required by the combination as claimed in claim 20, in accordance with 35 USC §112, 6th paragraph.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Baertsch (US 6,470,071 B1) teaches a detector system run entirely by the control system. Petrick (US 6,343,112 B1) and Haendle (US 5,436,952) each teach two different data acquisition modes being performed in sequence. Nishiki (US 5,027,380) teaches different data acquisition modes for different portions of the same detector.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R. Artman whose telephone number is (571) 272-2485.

The examiner can normally be reached on 9am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas R. Artman
Patent Examiner



EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER